

REPUBLIC OF MOLDOVA

REVISED TARIFF METHODOLOGY

**Regulatory Development
and Power Market Operations**

Moldova Energy Sector Reform
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1. INTRODUCTION

- 1.1. The original electricity industry of Moldova has been unbundled into its separate functional sections and corporate entities. Each separate utility entity now has separate responsibility for its operations, cost accounting and financial results.
- 1.2. On September 17, 1998, the parliament of Moldova passed the Electricity Act of 1998 which then became law on December 17, 1998. This Act established the National Agency for Energy Regulation (ANRE) as the commission authorised to issue and administer licenses to the entities involved in the industry and to regulate the electricity pricing structure and service provided to consumers.
- 1.3. The ANRE has issued licenses which are described in Paragraph 6 below.
- 1.4. The development of a tariff structure for each section of the industry is expected to reflect actual costs over the long-term, tariff structures implemented by ANRE which will include price caps, benchmark pricing or other incentive mechanisms to encourage more efficient acquisition of electricity supplies and provision of network and other required services.
- 1.5. The ANRE has already developed a tariff methodology which reflects the costs involved to a high degree. To some extent it already follows the Retail Tariff formula set out in Paragraph 8, but to date the underlying cost formulations are controlled by policy to artificially average the costs across the industry with the aim of producing a uniform tariff to all customers. The existing methodology for tariff pricing fails to take into account the following variables:
 - 1.5.1. The license conditions which call for tariffs which respect the corporate boundaries of the distribution companies and the specific costs of providing service to the consumers of each utility;
 - 1.5.2. The license conditions which recognize in tariffs the voltage level of the service connection to each consumer and, therefore, the actual electrical losses incurred to provide service at the meter; and
 - 1.5.3. The type of customer and, therefore, the different demand and cost profiles they typically impose on the system.
- 1.6. The purpose of this paper is to set out the framework for tariffs which is essential to the reform process and consistent with the terms included in the existing license conditions with a view toward providing a basis for ANRE to modify its current Tariff Methodology accordingly.
- 1.7. A robust, comprehensive and reliable tariff process and methodology is an important ingredient in Moldova's economic recovery plan which calls for the sale of distribution and generation assets to private investors during 1999.

- 1.8. ANRE should consider alternative tariff proposals which may emerge during the privatization process, provided the results are consistent with the tariff goals and principles set forth below.

2. GOALS

- 2.1 To provide customers with fair and reasonable price structures consistent with the maintenance of a financially and operationally secure electricity supply system.
- 2.2 The costs reflected in the tariff should be structured in such a way to encourage the efficient use of both fuel and plant.
- 2.3 To encourage operators towards efficient use of electrical plant and fuel, based on financial benefits/penalties rather than political command.
- 2.4 To provide all licensed participants in the public electricity industry with a fair and reasonable return for their service and production, including a reasonable profit.
- 2.5 To encourage customers towards efficient and economical use of energy based on price signals.

3. OBJECTIVES

- 3.1 To initially provide the structure for the formulation of cost related tariffs for each section of the electricity industry taking into account the limited scope for competition in the current system configuration.
- 3.2 To structure the tariff formulation process so that it can progressively be modified to keep pace with movements towards a more commercially competitive market system.
- 3.3 To provide a tariff structure and regulated environment that gives confidence to prospective private investors in the Moldovan electricity industry.
- 3.4 To separate those components of cost/tariff which are, and will always be, natural monopolies (e.g. transmission and distribution) from those components that could eventually become truly market based (e.g. production and supply trading). The monopolistic operations would then be regulated while trading could eventually be left to some competitive forces with only light handed regulation.

4. PRINCIPLES

- 4.1 The tariffs must be based on accurate cost information and a transparent formulation process.
- 4.2 By its very nature electricity is a commodity that has virtually no storage capability so the market and, therefore, the tariff must be capable of reflecting short term variations in cost. The tariffs should be structured in such a way that they can develop to reflect costs which vary by time of day or season and by demand profile. Even if these variable cost components may not at present be reflected in the pricing structure they should be kept as separate cost entities within the Retail Tariff formula so that their variable effects can be implemented at a later date.
- 4.3 The formula for the local distribution tariff should be formulated so that it can reflect the varying costs associated with the delivery of electricity to customers connected at different voltage levels. Again this may not be directly possible at present due to the lack of cost separation in the existing accounting systems. However it should be recognised that the costs do vary considerably between voltage levels and a logical method developed for apportioning costs to voltage levels until the accounting systems can separate the costs at source.
- 4.4 The Retail Tariff generated by the process should give the end-use customer clear and accurate price signals leading to economical and efficient use of energy.

5. REGULATION

- 5.1. The licensee is responsible for justifying that the costs and any investments included in the tariff formulation are reasonable. The regulator has the right to challenge these costs and investments and if necessary reject them if he considers them unreasonable or imprudent.
- 5.2. There should be clear separation of activities and costs between potentially competitive and naturally monopolistic activities to clarify the regulatory situation and allow for eventual differentiation in regulatory control.

5.2.1. Potentially Competitive

Participants whose activities would eventually be subject to competitive market forces and would require only light-handed regulation.

5.2.2. Natural Monopolies

These licensees are and will always be operating natural monopolies because the geographical situation precludes duplication of transmission and distribution network assets. Such activities have little or no competitive pressure from a market

situation and will therefore need to remain the subject of careful regulation by the ANRE.

- 5.3. Associated with the development of a tariff structure should be the development of a procedure for collecting and accurately analysing the true costs involved in the production, transmission, distribution and supply of electricity.

6. LICENSEES

- 6.1. The ANRE has issued licenses to all the existing participants in the Moldovan electricity industry. The licenses and the licensees to whom they have been issued are set out in Attachment A.
- 6.2. Licenses have been issued to the four existing companies who generate electricity within Moldova with a total energy output in excess of 20 Megawatts.
- 6.3. The separate licenses for provision of a Central Dispatch Service and Transmission System have been issued to Moldtranselectro.
- 6.4. Separate licenses for Distribution Network services and for providing supplies of electricity at regulated tariffs have been issued to each of the five distribution companies.
- 6.5. Licenses have also been issued to twelve independent electricity suppliers. These suppliers are prevented from entering the retail electricity market until the year 2001.

7. LICENSE CONDITIONS

- 7.1. The following license conditions are particularly relevant to the tariff setting process.
- 7.1.1. Accounting records must be maintained and financial statements produced in accordance with the National Accounting Standards of Moldova.
- 7.1.2. A reasonable apportionment of common costs into tariff cost assessments should be carried out in accordance with accepted business practice. The ANRE must be informed of the apportionment methods used.
- 7.1.3. There must be no cross subsidies between customers, groups of customers or different activities undertaken by the licensee.
- 7.1.4. The licensee is obliged to ensure that any activity including tariff setting does not impede competition in the industry.
- 7.1.5. The licensee must set reasonable tariffs consistent with maintaining a high level of quality and reliability.

- 7.1.6. The structure of the tariff must encourage the improvement of operational and economic efficiency.
- 7.1.7. Tariffs are to be developed by the Licensee and approved by the ANRE.
- 7.1.8. Tariffs will be modified for inflation from time to time by the ANRE.

8. RETAIL TARIFF

8.1. The Retail Tariff for electricity consumed shall be calculated by the following formula:

$$RT_{ij} = \left[\frac{PP + T + D}{(1 - LF_1) * (1 - LF_2) *(1 - LF_i)} + N_i + S_j \right] \times \left[\frac{1}{1 - U_j} \right]$$

Where:

- RT_{ij} = Retail Tariff specific to customers in group j connected at voltage i.
- PP = The weighted average cost per kilowatt-hour (kWh) of electricity (the “Purchase Price”) from all sources delivered to the Licensee in the relevant accounting period;
- T = The weighted average cost per kWh delivered to the Licensee in the relevant accounting period for transmission services provided on the high voltage transmission network;
- D = The weighted average cost per kWh delivered to the Licensee in the relevant accounting period for services provided by the Central Dispatch Centre;
- LF_i = Loss Factor at the specific voltage class i;
- i = Voltage class at which a customer is connected to the network;
- j = Customer group;
- N_i = The cost per kWh delivered to a customer for Use of the Distribution Network applicable to voltage class i;
- S_j = The cost per kWh delivered to a customer for Supply of Electricity services applicable to customer group j;
- U_j = Amount allowed by the ANRE for uncollected consumer bills as a percentage of revenues by customer group j.

For purposes of calculating the Retail Tariff the relevant accounting period is the period over which customer consumption has been measured.

- 8.2. Residential Retail Tariffs determined in accordance with the provisions of this paragraph may be modified as required by the legislation of Moldova for application to consumers eligible for Privileged Tariffs.
- 8.3. It is important that the component parts of the Retail Tariff are calculated and treated as discrete entities even though it may be seen as more convenient at present to aggregate some costs and subsequent tariff components. This will ensure that the process remains robust in its ability to reflect true costs in a flexible manner without repeated alterations as the market develops.

9. COMPONENTS OF THE RETAIL TARIFF

9.1 GENERAL COSTS

- 9.1.1. The ANRE has already analysed which costs should be allowable for each licensee. The general cost categories which apply to all licensees are :

Salaries
Consumables
Third party costs
Depreciation and replacement costs
Overhead costs
Social fund contributions
Tax liabilities

- 9.1.2. There are also allowable costs which are specific to the activity of each License and these are set out under each Retail Tariff component description below.

- 9.1.3. The ANRE has currently set 5% mark up on current cost as being a reasonable profit margin.

9.2. PURCHASE PRICE

- 9.2.1. The output of the licensed generators producing electricity within Moldova are currently the subject of a tariff approval by the ANRE. As these companies become privatised it is likely that control of the price for their output will be determined by purchase and sale contract terms purchase and sale.

- 9.2.2. Attachment B provides a guide to the resources normally available to Moldova.

- 9.2.3. The existing ANRE approved tariff allows the following costs in addition to the general categories set out above:

Fuel costs
Operating costs
Running costs
Maintenance costs

- 9.2.4. The ANRE will analyse purchase costs from the various sources available to Moldova and produce a price benchmark for the Wholesale Price of electricity delivered to the Regulated Tariff Supplier. This benchmark would be based on a weighted average of all purchases during the analysis period together with a forecast increment for the period of implementation. This price benchmark would hold for one year but be kept under review by the ANRE and only adjusted within that period if a fluctuation in the Wholesale Price would result in unreasonably high windfall profits or unacceptable losses.

9.3. TECHNICAL LOSS FACTORS

The current factors in use are the result of a detailed engineering study. It would be desirable to encourage the reduction of technical losses by progressively reducing the regulated loss allowances embedded in the tariffs. That process may need to wait until more accurate metering and systems analysis is available.

9.4. DISPATCH TARIFF

- 9.4.1. The ANRE has approved the direct operating costs of providing a dispatch service in addition to the general categories set out above. These will include provision of any control, data handling and communication equipment necessary for the provision of an efficient dispatch service.
- 9.4.2. The future development of a complex energy market process will increase the costs necessary for operating a dispatch system and this should be reflected in tariff revisions after regulatory review.

9.5. TRANSMISSION TARIFF

- 9.5.1. In addition to the general costs set out above, the costs allowed in the formulation of the Transmission Tariff are the costs of operating and maintaining the high voltage transmission system.
- 9.5.2. Although the transmission system will remain state owned any future capital investment in system or metering should be reflected in any tariff revision.

9.6. DISTRIBUTION TARIFF

- 9.6.1. Cost allowed in the formulation of the Distribution Tariff are the operating costs, metering and maintenance costs. Return on capital investment would be an allowable component but very little if any capital investment is possible in the present economic climate.
- 9.6.2. Future private investors will require assurance that the tariff mechanism will give a reasonable rate of return on their initial investment and planned capital

improvements in the distribution assets and services. As there is only minimal capital investment included in the tariff formulation at present, it should be recognised that special provision for substantial investment would need to be allowed in any subsequent tariff revision.

9.6.3. The advanced methods of assessing reasonable rates of return used in US or UK utility industries are extremely difficult to apply to the Moldovan situation. This stems mostly from a lack of useful valuation of existing assets.

9.6.4. Although there is no direct method of separating costs due to each voltage level of the distribution system, it is essential that a method for apportioning costs between voltages should be developed. In the absence of any other method a simple assessment of the lengths of circuits at each voltage weighted by the average cost of construction would present a basic model for the cost split.

9.7. SUPPLY TARIFF

In addition to the general costs set out above, the costs allowed in the formulation of the Supply Tariff are the costs of providing Customer Service, billing services, debt financing and debt recovery costs.

9.8. UNCOLLECTED DEBT ADJUSTMENT

Even in healthy economies some level uncollected consumer bills is unavoidable and, provided utility management has demonstrated diligence in its pursuit of non-paying customers (including, of course, the prompt termination of service until debts are paid), utility commissions usually recognize the bad debt costs incurred by the utility as a normal component of a company's directly allowed costs included in tariffs. The recovery of excessively high levels of debt from the tariff would be considered as cross subsidisation between customers who pay and customers who do not pay. In Moldova non-payment is so acute that some temporary measures may be needed to enable the industry to become healthy. The Uncollected Debt Adjustment process will be monitored by the ANRE with the objective of reducing these costs to the lowest possible level as soon as possible.

10. IMPLEMENTATION PROCESS

10.1. Each licensee will be required to complete forms detailing their costs and sales data on a monthly basis. These forms are currently being developed and trialed. The data requested will flow from the accounting systems and audit trails linked to the company accounts produced to the National Accounting Standards of Moldova. These returns will be completed as active Microsoft Excel spreadsheets, together with a formal reference print, and sent to the ANRE.

- 10.2. The licensee will make their own assessment of their tariff structure. These tariff structure will be submitted in a standard form to the ANRE either at the request of the ANRE or in support of a tariff adjustment request by the Licensee.
- 10.3. Following analysis, discussion and agreement with each licensee, the ANRE will publish the approved tariff structure to be adopted by that licensee.
- 10.4. The tariff structure will normally be fixed, but subject to regular review after three years. However, the actual rates will be adjusted for inflation or other major market fluctuations on a more regular basis.
- 10.5. The ANRE will develop and publish a method for adjusting the tariffs for inflation.
- 10.6. The Wholesale Market process is illustrated in Attachment C and the Retail Market in Attachment D

11. REGULATION PROCESS

- 11.1. Licensees will be required to complete cost and sales returns on a monthly basis to enable the ANRE to regularly monitor the accuracy of the tariff implementation.
- 11.2. The ANRE will continue to review the tariff structure and its effects on the industry and may revise the process from time to time as the industry develops. In particular the ANRE will constantly review fuel prices available to Moldova, currency exchange rates and any other factors which could affect the benchmark set for the Wholesale Price.
- 11.3. The ANRE will accept complaints direct from customers and licensees who have been unable to resolve their disputes on normal contractual grounds. Licensees will be obliged to inform their customers of their right to refer unresolved disputes to the ANRE.

12. DATA SYSTEMS

- 12.1. As licensees develop automated management accounting information systems it is essential that the tariff setting process is provided with cost and sales information as an integral part of that information system as required by license conditions.
- 12.2. Licensees should actively pursue systems where sales and billing records information can automatically be provided to ANRE to facilitate the tariff setting process.
- 12.3. As the economic situation allows, more accurate and sophisticated metering and meter data handling systems should be installed. This will allow the tariff to reflect differing costs at different times of day and season and, therefore, more accurately reflect true costs.

13. FUTURE DEVELOPMENT

- 13.1. The monopolistic operations should continue to be regulated while supply/trading can be progressively modified to keep pace with movements towards a more commercially competitive market system.
- 13.2. Many of the costs associated with high voltage transmission and with local distribution network operation are related to the installed capacity of the cables and equipment that constitutes those networks and the capital invested in such equipment. It would therefore be desirable to move towards a form of tariff which recognizes the electrical capacity required to provide service to each customer at the delivery point for electricity. This would provide a direct relationship between these capacity-related costs components of the tariff and the return that an investor could expect when investing in network assets.
- 13.3. This process could be further refined by considering “site specific” formulation for very large customers, where the physical components of transmission and distribution can be identified and separately costed. These costs would then removed from the general averaging of costs for the general tariff. This process would make the transmission and distribution charges for very large customers extremely cost reflective and also make the average tariff more accurate.
- 13.4. Consideration should be given in the future to the concept of a separate agency with responsibility for collecting, collating and disseminating the data from meter reading throughout the system. Such data can readily be made secure and confidential to the parties involved only. Experience in other systems has shown that a specialist service can provide more accurate and timely data and keep pace with developing technology.

Attachment A**Table of Licenses**

TITLE	LICENSEE
License for Generating Electricity	CHP – 1 CHP – 2 CHP – North Moldtranselectro - Hydro
License for Central Dispatching Activity	Moldtranselectro
License of High Voltage Transmission Grid	Moldtranselectro
License for Distribution of Electric Energy	Chisinau DC Central DC Northern DC North Western DC Southern DC
License for Supply of Electricity at Regulated Tariff	Chisinau DC Central DC Northern DC North Western DC Southern DC
License for Independent Electricity Supply	Adanerts Ltd. Avro Ltd. Braconi JSC Companie Unitara de Service Ltd. Energoimpex JSC Euroenergo Ltd. Everet-Morison Ltd. Expo-Com Ltd. Finve-Camelotrex Ltd. Flex-Motors JSC Oferta-Plus Ltd. Pogar-Flat Ltd.

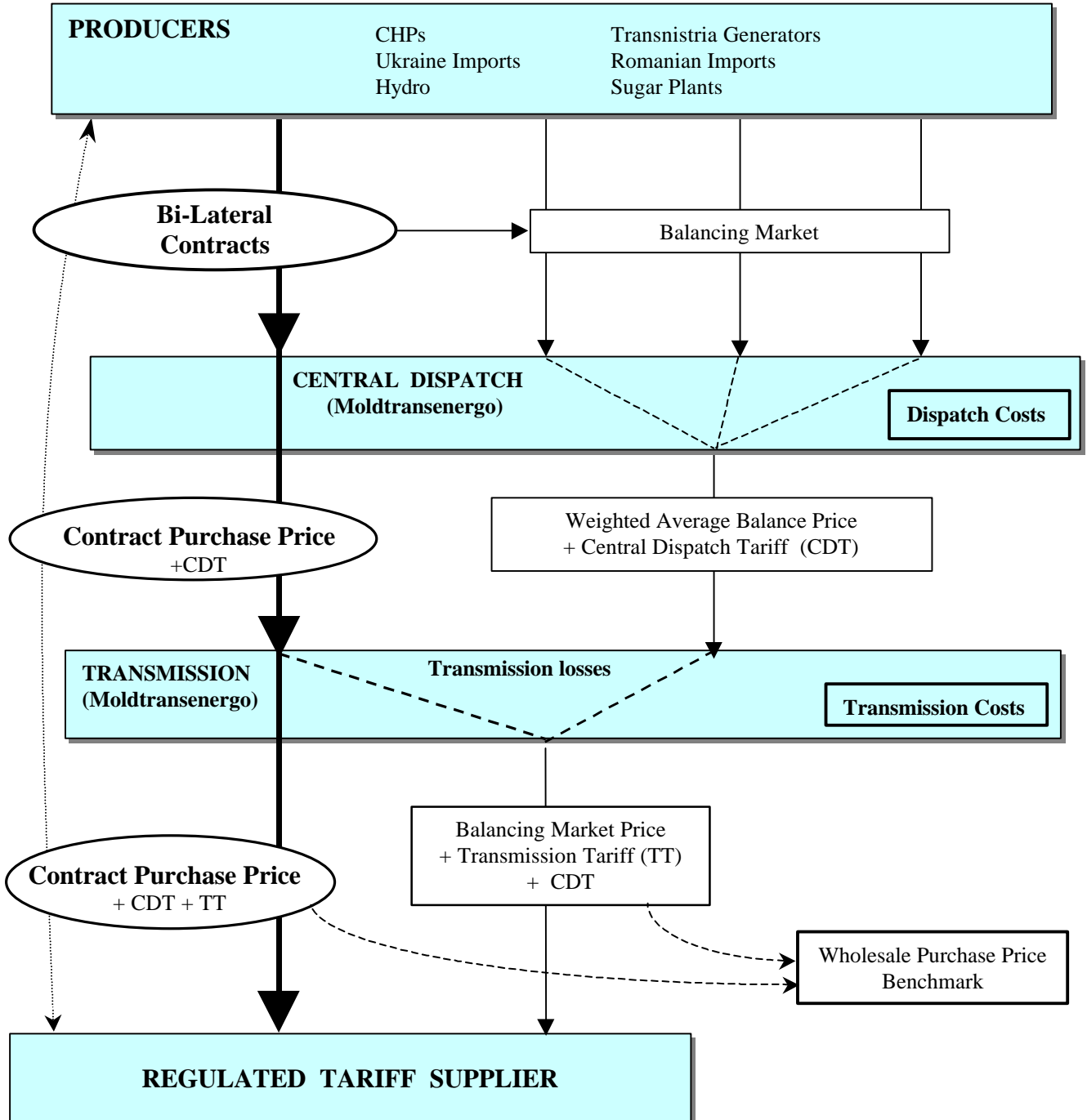
Attachment B**Industry Statistics**

Electricity Energy Sources - November 1998

Source	Installed Electrical Capacity (MW)	Available Capacity (MW)	Comparative Price (c/kWh)
CHP – 1	45	45	3.2
CHP – 2	240	210	3.0
CHP – North	18	18	3.4
Sugar plants	90	20	2.5
HYDRO	20	20	0.5
Moldavskaya Gres	650	200	3.8
Ukraine	900	900	3.5
Romania	100	100	4.3

Attachment C

Wholesale Market Transactions



Attachment D

Retail Market

